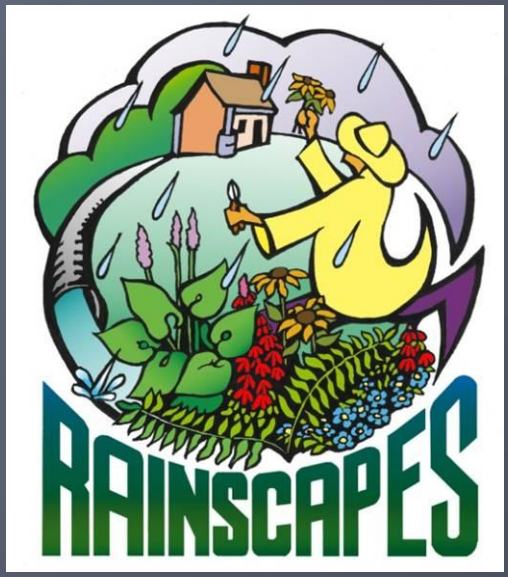
RainScapes

Techniques and Rebates



RainScapes Stormwater Management Tools:
Small scale distributed practices for improved watershed health

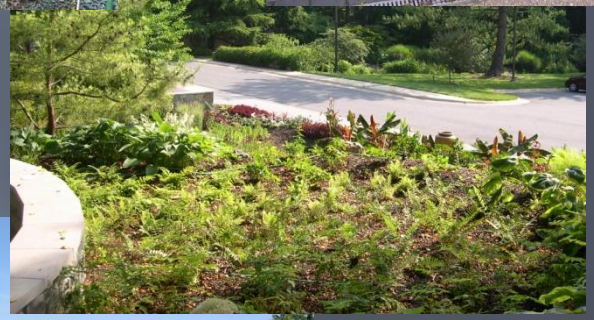
2010

Department of Environmental Protection
Montgomery County
Maryland

Topics

- RainScapes Goals
- Techniques (and rebates)
  - Site Evaluations
  - Site inspections
  - Design
  - Maintenance







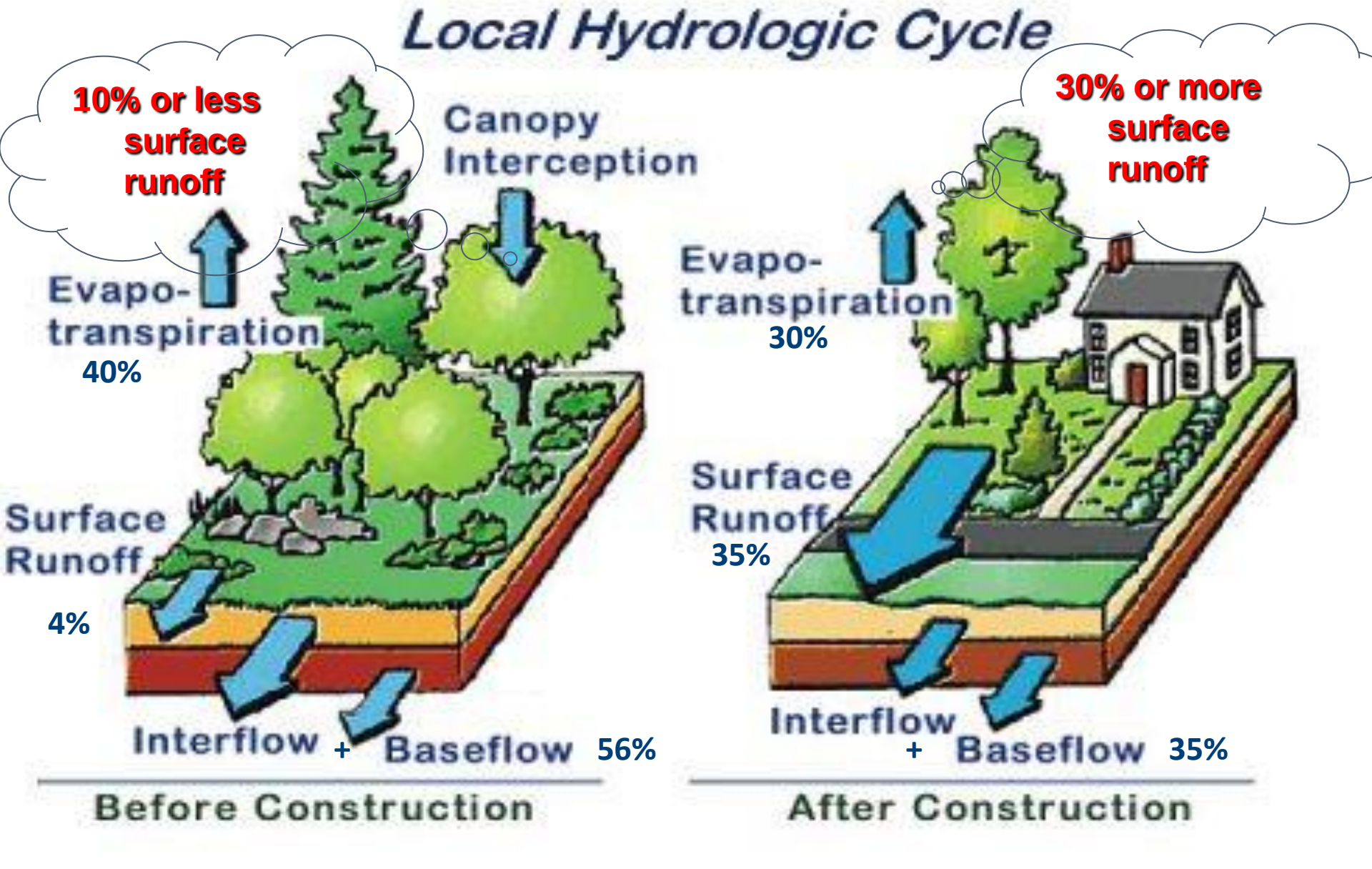
RainScapes:

Getting to the Source

- Urban Stormwater Management
  - Reduce Runoff Volume
  - Reduce Pollutants from Neighborhoods
  - Recharge Groundwater

- Water Conservation and Habitat Diversity
  - Native Landscapes
  - Harvesting and Reuse
  - Green Roofs
- Individual Stewardship

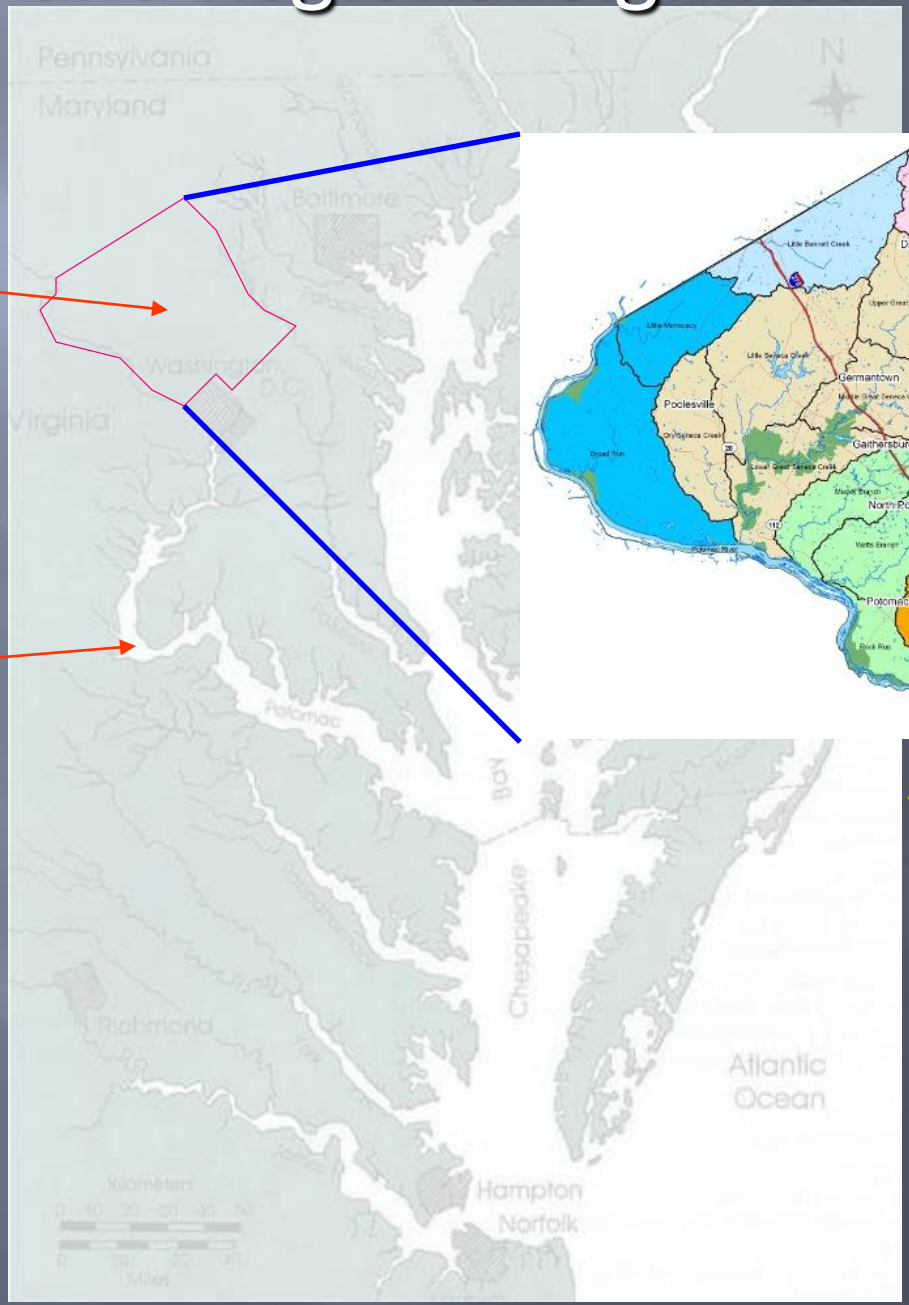
What happens when it rains?

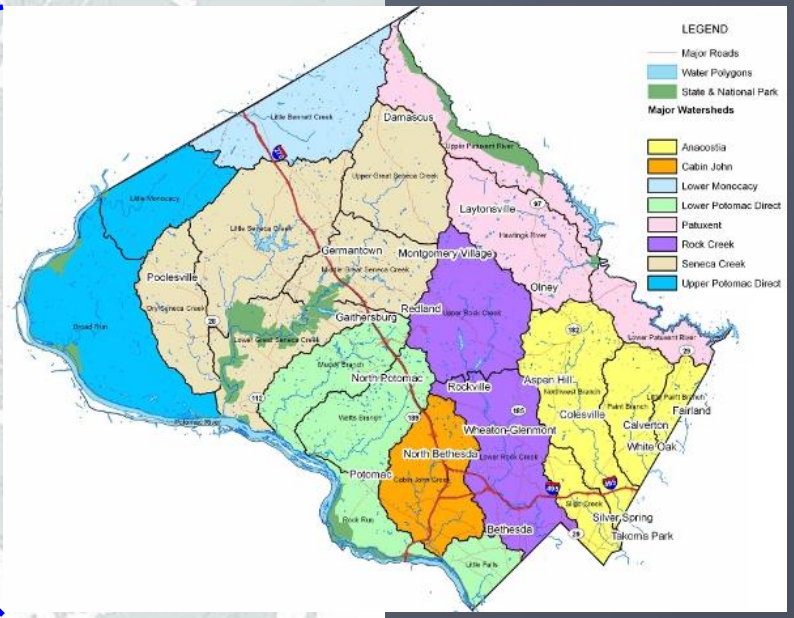


Local and Regional Significance

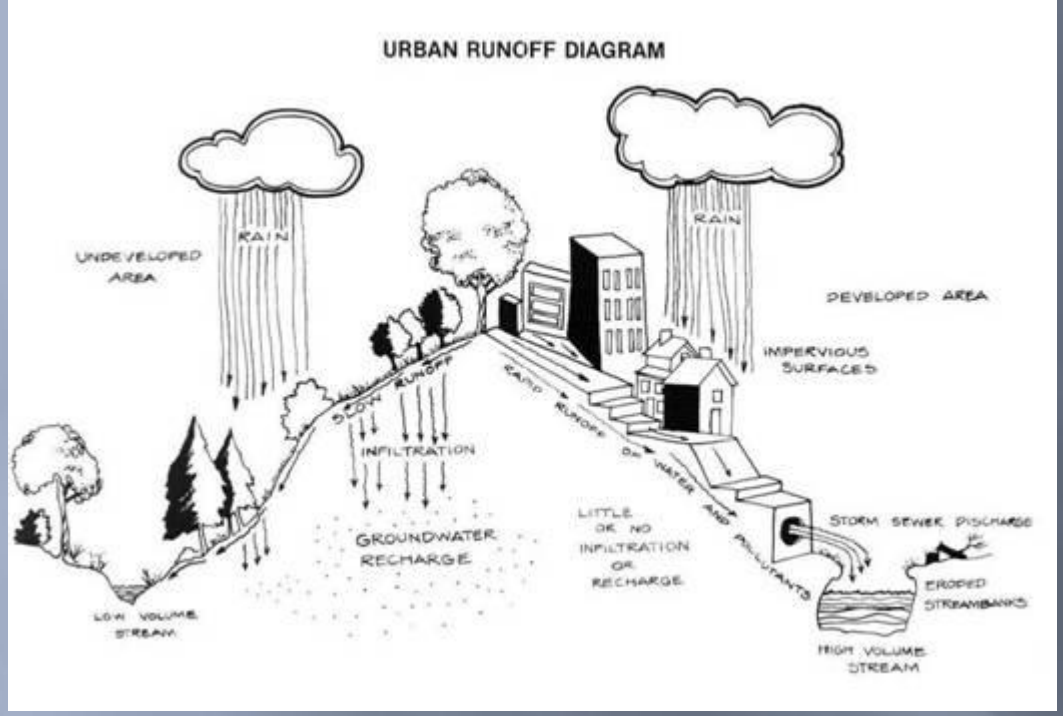
Montgomery County

Potomac River





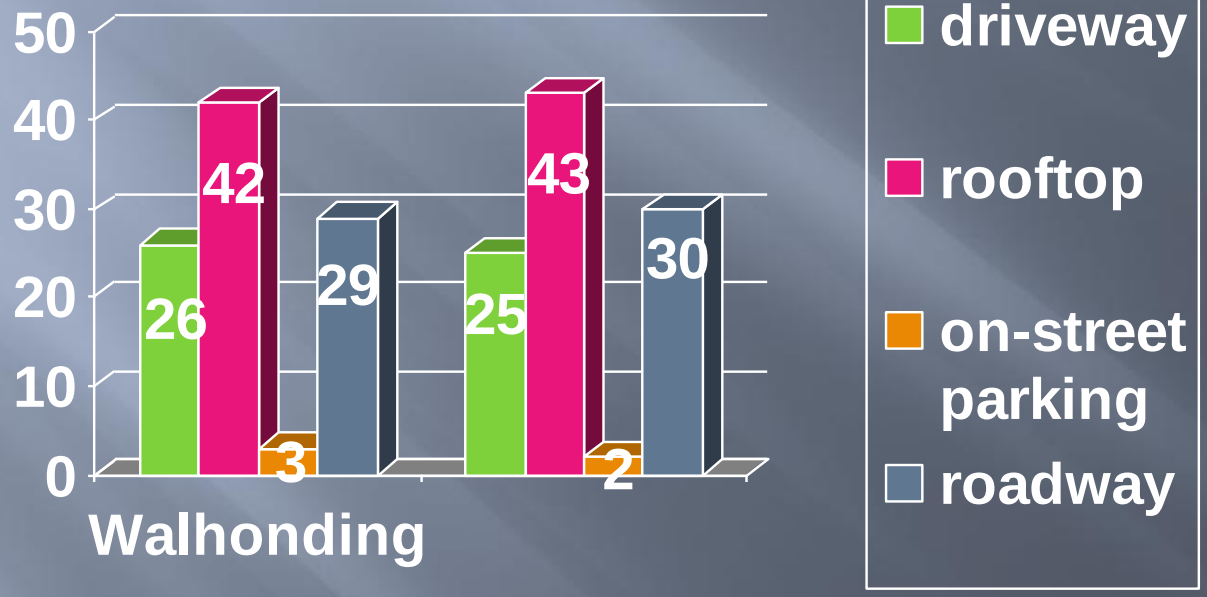
Anacostia
Cabin John
Lower Monocacy
Lower Potomac District
Patuxent
Rock Creek
Seneca Creek
Upper Potomac District



Consequences of traditional development on Runoff

- Increased % of land that is impervious (hard surfaces)
- Increased runoff and pollutants from the landscape
- Stormwater flows into surface channels and stormdrains, not the ground
- Reduced groundwater recharge (infiltration)
- Streams become “flashy” with lower baseflow and higher storm flows
- Eroding streambanks deposit sediment and degrade aquatic habitat
- And more…

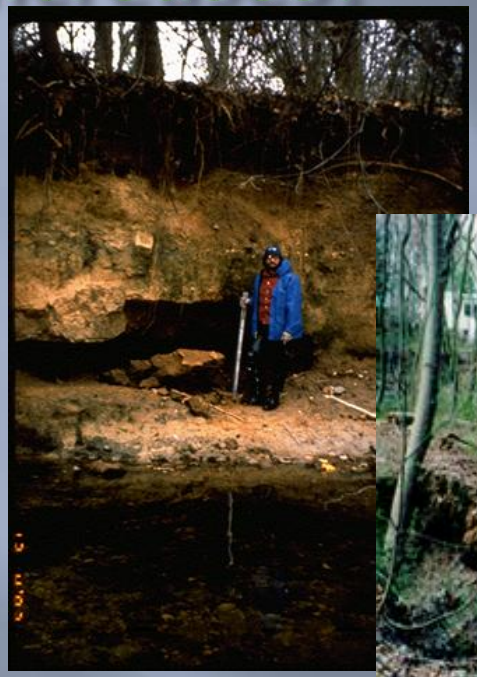
Typical pre-1970s development impervious cover location



ROOFTOPS

In typical urban residential areas, rooftops account for 30-40% of the total impervious area – capturing runoff from residential rooftops CAN MAKE A DIFFERENCE

What happens when stormwater runoff increases?



Sanitary Sewer Overflows / Threats to infrastructure

Stream temperatures rise / loss of fish habitat /Down-cut and enlarged, shallow streams

LOSS of navigation and commerce

Bladensburg was a busy port, shipping out flour and tobacco, until the river silted up by 1800.

- http://www.bladensburg.com/html/history.html

Rainscapes provide a Low Impact Development (LID) Source control Stormwater Management set of tools

- LID = preserve and restore predevelopment hydrology
- RainScapes LID Toolbox
  - Permeable Pavement
  - Site Fingerprinting
  - Maintain Natural Flow lines
  - Rain Gardens and Bioretention
  - Decentralized source controls
  - Many more!

Integrated Site Evaluation

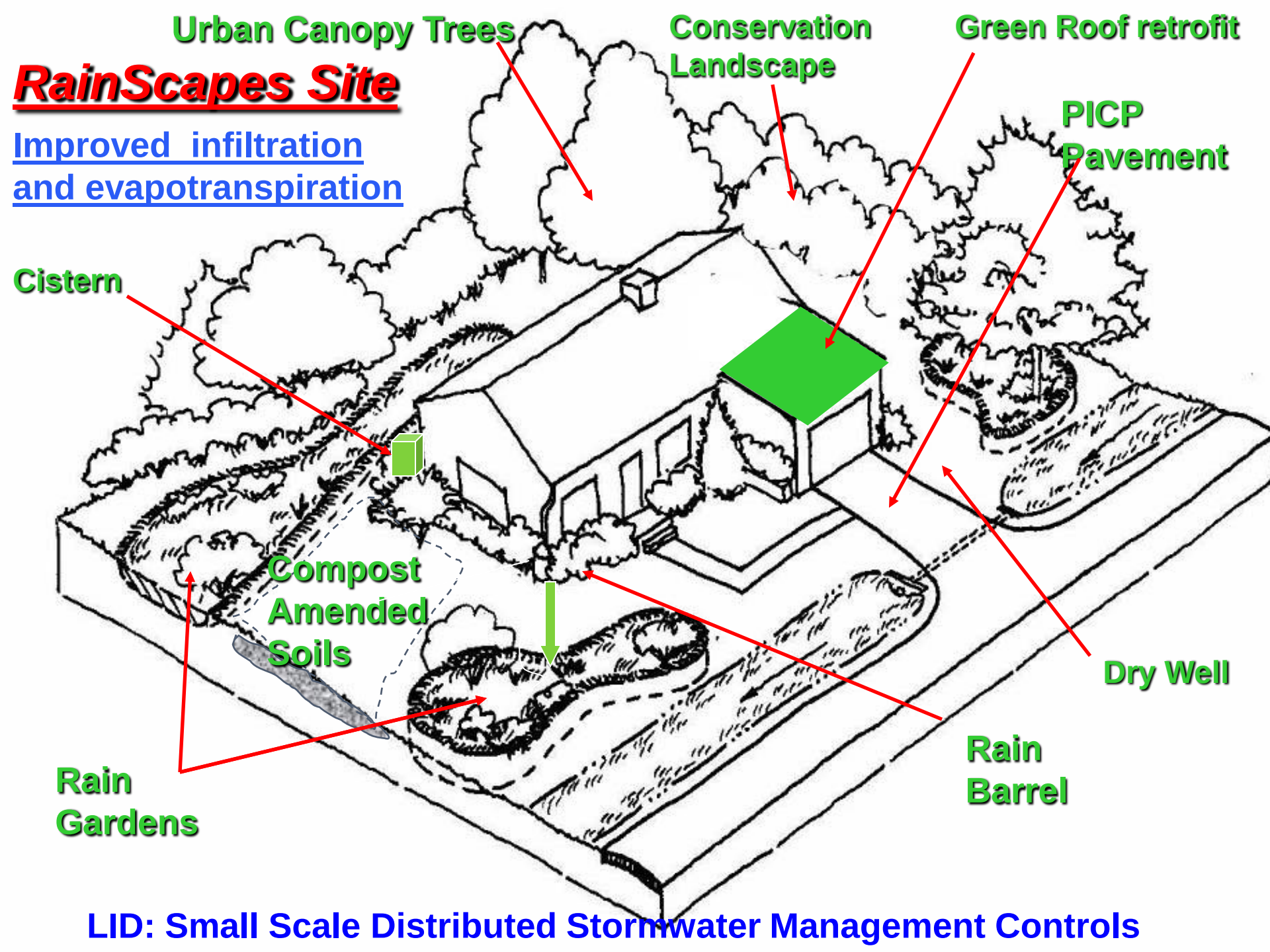
Definite drainage problem to solve

- Map drainage areas
- Identify catchment areas from off-site
- Identify volume of water
- Evaluate what practices will fit on site

Sustainable landscape practices desired

Identify areas which could be converted

- ✓Turf removal
- ✓Pavement removal
- ✓Canopy additions
- ✓Water harvesting


Urban Canopy Trees
Conservation Landscape
Green Roof retrofit
RainScapes Site
Improved infiltration and evapotranspiration
PICP Pavement
Cistern
Compost Amended Soils
Dry Well
Rain Barrel
Rain Gardens
LID: Small Scale Distributed Stormwater Management Controls

RainscapesTechniques:

Rain Gardens

RainScapes Rewards Rebate:

Rain Gardens

- **Residential:**
  - **$1200 per property**
  - **Sized for a specified amount of water**
  - **75% plants must be native**

- **Commercial/ Institutional:**
  - **$ 5000 per property total (max $2500/rain garden based on .50/sf of impervious surface treated, whichever amount is greater)**
  - **Sized for a specified amount of water**
  - **75% plants must be native**

Rain Gardens

Site Evaluation

- Site must pass a perc. test
- Map existing drainage patterns
- Site 10 feet away from foundations
- Site 15 feet away from downhill property line
- > 25 ft from septic system drain field
- >100 ft from wells
- Away from utility lines
- In full to partial sun if possible
- Bottom of garden =2’ above seasonal high water table
- Best for slopes < 10%
- For larger drainage areas, consider splitting the flow into two rain gardens
- Overflow for rain garden should be directed to vegetated surface, not pavement

Place the garden between runoff source and where it would leave the property

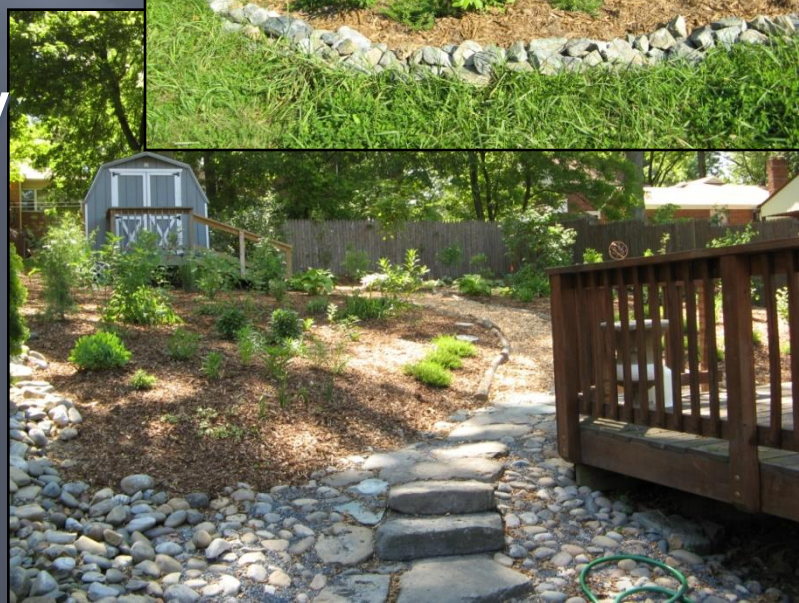
RainscapesTechniques:

Conservation Landscaping

RainScapes Rewards Rebate:

Conservation Landscaping

- **Residential:**
  - **$500 per property/**
  - **500 sf of turf or invasive species removed**
  - **Replant with 75% native species**
- **Commercial/ institutional:**
  - **50% of cost (up to $3000)/property**
  - **1000 sf of turf/invasive species removed**
  - **Replant with 75% native species**

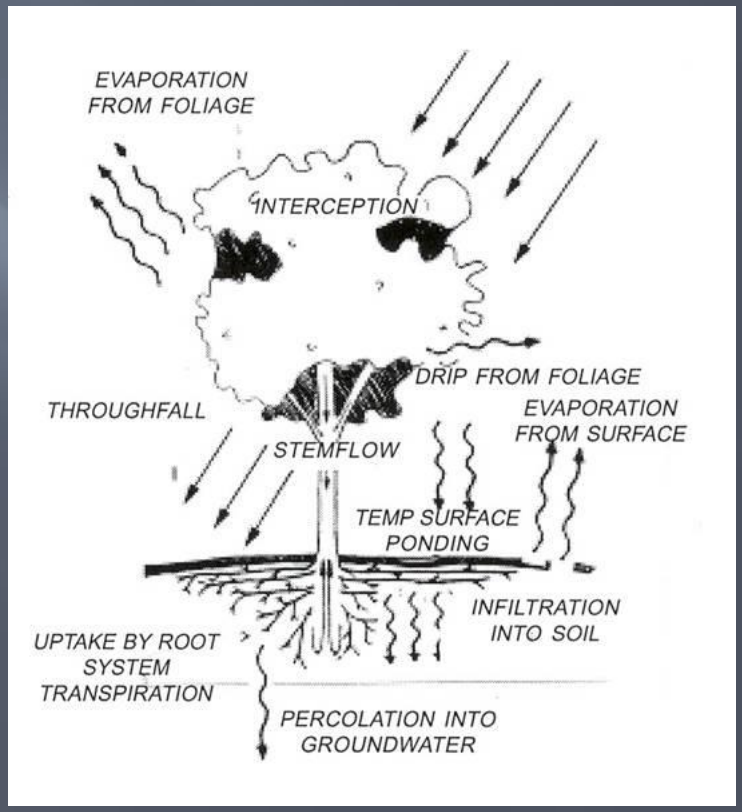


Conservation Landscape

Site Evaluation

- Measure turf area being removed
- Photo document
- Identify
  - ✓ Exposure
  - ✓ Soil conditions
  - ✓ Water conditions
  - ✓ Constraints
- Order a soils test
- Select plant community to emulate
- Map area for project

Rainscapes Technique:
Urban Tree Canopy



RainScapes Rewards Rebate:

Urban Tree Canopy

$600 per property, maximum of $200/tree

- provide shading of AC or impervious surface,
- Or expand existing canopy
- Or provide a windbreak for winter winds
- Must be native (to Montgomery County) canopy tree

Urban Tree Canopy

Site Evaluation

- Check for overhead wires
- Distance from existing trees and foundations
- Exposure for proposed planting area
- Photo document

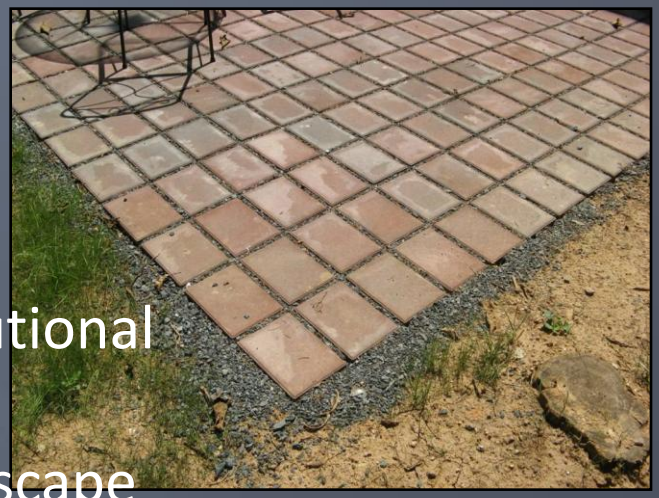
RainScapes Techniques:

Permeable Pavers

Installation to be done to icpi.org standards

RainScapes Rewards Rebate:

Permeable Paver Retrofits



$1,200 per property for residential
$ 5000 per property for commercial/institutional

- Must be for conversion of existing hardscape
- a minimum area of 150 sf

- Patios
- Driveways
- Walkways
- Courtyards

Permeable Paver Retrofits

Site evaluation

Measure area being converted from impervious pavement to pavers

Evaluate slope (< 5%)

Check for foundation clearance

Calculate drainage area/ volume of water

Identify depth to seasonal high water table

Perform percolation test

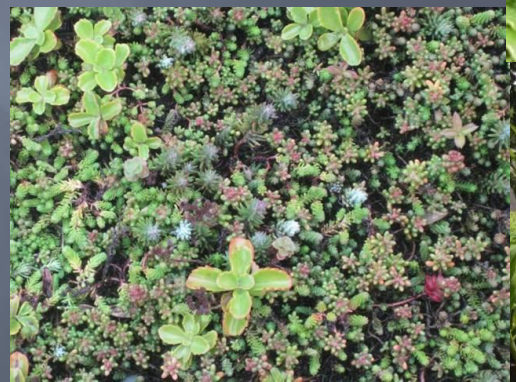
RainScapes Techniques:

Green Roofs

RainScapes Rewards Rebate:

Green Roofs

- $1,200 per property for SF residential
- $5000 per property for commercial/institutional
- *Must be on an existing roof and cover either ¼ of the roof area or 300 sf (whichever is smaller)*



- Extensive Greenroofs only
- Replacement roofs
- Provide maintenance agreement with installation

Extensive Green Roof

Site Evaluation

- **Retrofit** not new construction for rebates
- Provide structural evaluation of roof (7 lb/sf for each 1” of depth;) 4” typical depth
- Do shade analysis
- Estimate volume of capture

RainScapes Techniques: *Water Harvesting - Rain barrels*

RainScapes Rewards Rebate: *Water Harvesting - Rain barrels*

REBATE: $200

- **Must capture 200 gallons/ SF home, commercial or institutional**
- **Must capture 100 gallons/townhome**

Rain Barrels

Site evaluation

- Foundation
- Size of proposed project
- Drainage area
- Grade around the barrel location
- Overflow area
- Room to link more than one barrel together
- Opportunities to overflow to another RainScapes technique

RainScapes Techniques:
Water Harvesting - Cisterns

RainScapes Rewards Rebate:
Water Harvesting - Cisterns

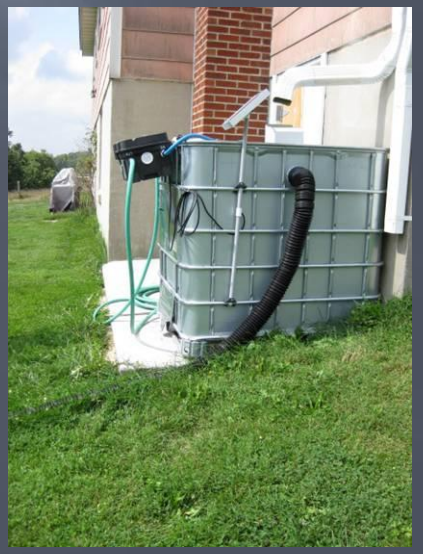
- $1/gallon
  - $500 maximum for residential,
  - $2000 for commercial/ institutional
- Must capture 250 gallons

Cisterns

Site Evaluation

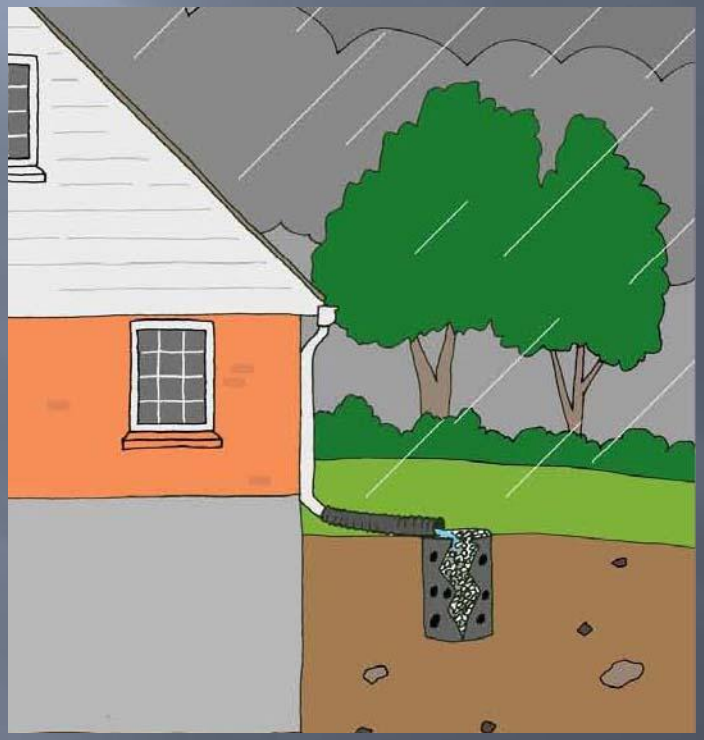
- Foundation area - level
- Drainage area
- Grade around the cistern location
- Overflow area; size must be scaled to size of cistern
- Size of proposed project
  - Design storm size requirement

- http://www.harvestingwater.com/



RainScapes Technique:

Dry Wells



RainScapes Rewards Rebate:

Dry Wells

- $ **300 per property**
- 2 types
  - linear drywell
    - diy or contractor installed
  - conventional drywell – contractor installed
- Rebate based on 50% of actual cost

Dry Wells

Site Evaluation

- Depth to groundwater
- Distance from foundation
- Perc. rate
- Room for which types – downspout flow recipient or driveway runoff recipient
- Available space for overflow

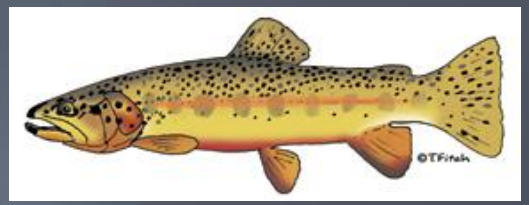
RainScapes Technique: Downspout Diversion*

*no rebate available

Downspout Diversion Basics

- Simple approach may work – redirect downspout flow with flexible tubing
- Carefully inspect grading to avoid basement seepage and lot to lot drainage problems
- Low cost and easy to do
- More engineered (and costlier) solutions:
  - Dry wells
  - French drains

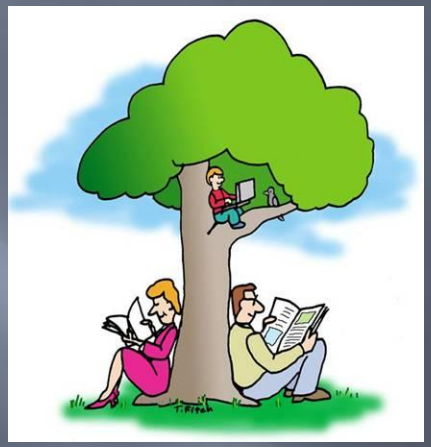
Who Suffers from Stormwater Runoff?



You get the picture….

What can be done to improve the environmental health of our watersheds?

- Reduce the amount of impervious area that sheds water directly into streams
- Plant Trees
- Plant conservation landscapes
  - Replace turf areas with deeper rooted plants
  - Grow and plant more native plants to better support native wildlife
- Build Rain Gardens
- Harvest rain water for irrigation
- ……many options!



For more information:

www.rainscapes.org